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Pinalitus KELTON (Heteroptera, Miridae) and its Allied Genera of Japan, with Descriptions of New Genera and Species¹⁾

Tomohide YASUNAGA²⁾

Biological Laboratory, College of General Education,
Kyushu University 01, Fukuoka, 810 Japan

Abstract The genus *Pinalitus* KELTON and its allied genera of Japan are diagnosed, including descriptions of the new taxa: *Yamatolygus*, *Pachylygus* gen. nov. and *Y. pilosus*, *Y. insulanus* spp. nov., and redescrptions of known species: *Pinalitus nigriceps* KERZHNER, 1988, *Yamatolygus flavigenis* (HORVÁTH, 1905), comb. nov., *Pachylygus japonicus* (KERZHNER, 1977), comb. nov. and *P. nigrescens* (KERZHNER, 1977), comb. nov. The genus *Salignus* KELTON, which is regarded as a relative of *Pinalitus*, is also diagnosed and a known Japanese taxon, *Salignus duplicatus medius* KERZHNER, 1979, is redescribed. A key to the genera and Japanese species is provided. A Far East Russian species, *Orthops festivus* KERZHNER, 1977, is transferred to *Pachylygus*.

Key words: *Pinalitus* and its allies; new genera; new species; new combination; Japan.

Introduction

The genus *Pinalitus* was proposed by KELTON (1955) to accommodate a single North American species, *Deraeocoris approximatus* STÅL, 1858, in his revisional study treating the *Lygus*-complex. KNIGHT (1968) added four new species to the genus from western United States and transferred *Lygidea solivaga* VAN DUZEE, 1921 to it. Subsequently, KELTON (1977) reviewed North American species of *Pinalitus*; he placed four species, *approximatus* STÅL, *rubricatus* FALLÉN, *solivagus* VAN DUZEE and *rubrotinctus* KNIGHT, under it and described a new species, *P. rostratus*. *Pinalitus rubricatus* is Holarctic in distribution, but it is thought to have been introduced to North America with imported conifer nursery stock (WHEELER and HENRY, 1992). KERZHNER (1988 a) described a new species, *P. nigriceps*, from the Russian Far East and placed eighteen Palearctic species including two known Japanese species, *Lygus flavigenis* HORVÁTH, 1905 and *Orthops japonicus* KERZHNER, 1977, under *Pinalitus*.

During my studies to clarify the Japanese fauna of *Pinalitus*, six species were recognized. Of these, two are apparently undescribed species related to *flavigenis* and other two are identified as *P. nigriceps* KERZHNER and *P. nigrescens* (KERZHNER),

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respectively. The former species was recently reported from Fukushima Prefecture (MIZOI & OSAWA, 1992), while the latter has not been previously recorded from Japan. As mentioned by KERZHNER (1988 a and pers. comm.), however, the placement of *flavigenis*, *nigrescens* and *japonicus* in the genus is unsatisfactory; they differ significantly from the type species of the genus in their body structure and host preference. KELTON (1977) indicated that all North American species are associated with coniferous trees: *Abies*, *Pinus*, *Pseudotsuga*, *Picea*, etc. Actually, in Japan *P. nigriceps* is collected only on *Pinus densiflora*, but the other species are never found on conifers. For example, *P. nigrescens* is associated with *Kalopanax* trees (Araliaceae) (KERZHNER, 1988 b) and *P. japonicus* is found on *Rosa multiflora* (Rosaceae) (YASUNAGA, 1991).

I compared the specimens of Japanese species with those of four Nearctic ones including the type species of the genus, and concluded that only *P. nigriceps* corresponds to 'true' *Pinalitus*, based on body structure and host plants. In the meantime, the remaining five species are better placed in other genera. *Pinalitus flavigenis* and the two undescribed relatives are characterized by the dense silvery pubescence and brownish hairs on dorsum, distinctly punctate pronotum, rather tumid scutellum, basally projected left paramere and a distinct spicule on the vesica. *Pinalitus japonicus* and *P. nigrescens* (and also *P. festivus* (KERZHNER), the Far East Russian species) exhibit such special features as the thick body, small eyes, conspicuously arched scutellum, distal characteristic spicule on the vesica, sclerotized plate in front of gonopore and enlarged female sclerotized ring. The genital structure of 'true' *Pinalitus* is rather similar to that of the genus *Salignus* KELTON, 1955.

In this paper, the genus *Pinalitus* is diagnosed and two new genera, *Yamatolygus* and *Pachylygus*, are proposed to accommodate the species that cannot be placed in 'true' *Pinalitus*. The former includes *Y. flavigenis* (HORVÁTH), comb. nov., *Y. pilosus* sp. nov. (=type species) and *Y. insulanus* sp. nov.; the latter is composed of three species, *P. japonicus* (KERZHNER), comb. nov. (=type species), *P. nigrescens* (KERZHNER), comb. nov. and *P. festivus* (KERZHNER), comb. nov. The genus *Salignus*, which is related to 'true' *Pinalitus*, is also diagnosed, and a known Japanese taxon, *S. duplicatus medius* KERZHNER, is redescribed. All above-mentioned Japanese species are described or redescribed, and a key to genera and Japanese species is provided.

All measurements in the text are given in millimeters. New distributional records are indicated with an asterisk after the name of the region. Terminology of the female genitalia is followed after SLATER (1950). Depositories of the specimens examined are abbreviated as follows: AC: Author's collection; BLKU: Biological Laboratory, College of General Education, Kyushu University, Fukuoka, T. SAIGUSA; HU: Laboratory of Entomology, Hokkaido University, Sapporo, S. TAKAGI; IC: Ichita collection, Kuroishi City, Aomori, T. ICHITA; NIAES, National Institute of Agro-Environmental Sciences, Tsukuba, Ibaraki, T. MATSUMURA; NSMT: National Science Museum, Tokyo, M. TOMOKUNI; USNM: U. S. National Museum of Natural History, USA, T. J. HENRY.

Genus *Pinalitus* KELTON, 1955

Type species: *Deraeocoris approximatus* STÅL, 1858, Stett. ent. Ztg., **19**: 185, by monotypy.

Pinalitus KELTON, 1955, Can. Ent., **87**: 282; KELTON, 1977, *ibid.*, **109**: 1549; KERZHNER, 1988 a, Nov. maloiz. poluzh. Nasek. daln. vost. SSSR, Vladivost., p. 69; KERZHNER, 1988 b, Opredel. Nasek. daln. vost. SSSR, **2**: 812.

Body slender, subparallel-sided; dorsal surface uniformly clothed with silky pubescence. Head rather oblique; vertex with a distinct basal transverse carina, weakly sulcate longitudinally. Antennae rather long and broad; 2nd segment almost linear. Rostrum long, extending beyond hind coxae.

Pronotum shining, not carinate laterally, provided with shallow and fine punctures; collar rather thick, shining; scutellum flat, weakly rugose. Hemelytra shallowly and finely punctate, covered with decumbent silky pubescence. Legs long; tibiae with strong spines.

Left paramere semi-circularly curved, with sensory lobe well developed, hypophysis tapered, hooked apically. Vesica with a long, spinulate lobe laterally and with a spicule and lobe-sclerites. Sclerotized ring of female genitalia small, oval (Fig. 5 E).

This genus is characterized by the slender body, long rostrum, finely punctate pronotum and hemelytra, flat scutellum, tapered hypophysis of left paramere and highly sclerotized vesica. The species of *Pinalitus* are known to occur in the Holarctic Region and are associated strictly with conifers.

Pinalitus nigriceps KERZHNER, 1988

(Figs. 1, 2 A, 5 E)

Pinalitus nigriceps KERZHNER, 1988 a, Nov. maloiz. poluzh. Nasek. daln. vost. SSSR, Vladivost., p. 31, figs. 102–107; KERZHNER, 1988 b, Opredel. Nasek. daln. vost. SSSR, **2**: 812; MIZOI & OSAWA, 1992, Fukushima-no-mushi, (10): 15, fig. 9.

Body small, slender; dorsal surface fuscous, uniformly covered with silky pubescence. Head shiny blackish; vertex weakly sulcate, with distinct basal transverse carina. Antennae pale brown; 3rd and 4th segments darker; length of segments I–IV as 0.53: 1.67: 0.93: 0.57 in ♂, 0.47: 1.63: 1.23: 0.50 in ♀. Rostrum brown, extending beyond hind coxae; apical part of 4th segment fuscous.

Pronotum shiny black, finely punctate; collar yellow; scutellum dark brown, with yellowish apex. Hemelytra brown; apical part of cuneus reddish dark brown. Legs pale brown; hind femora tinged with red; 3rd tarsal segments dark; length of hind femur: tibia: tarsus as 1.73: 2.50: 0.66 in ♂, 1.67: 2.33: 0.67 in ♀; proportion of hind tarsomere I–III as 20: 30: 29 in ♂, 11: 19: 20 in ♀.

Abdomen fuscous, shining, somewhat tinged with red. Left paramere with sensory lobe well developed, bearing dense long hairs, hypophysis tapered, with a small pointed process at apex; right paramere somewhat depressed, with hypophysis blunt at tip. Vesica with a long spinulate lobule, dentate lobe-sclerite, a pointed

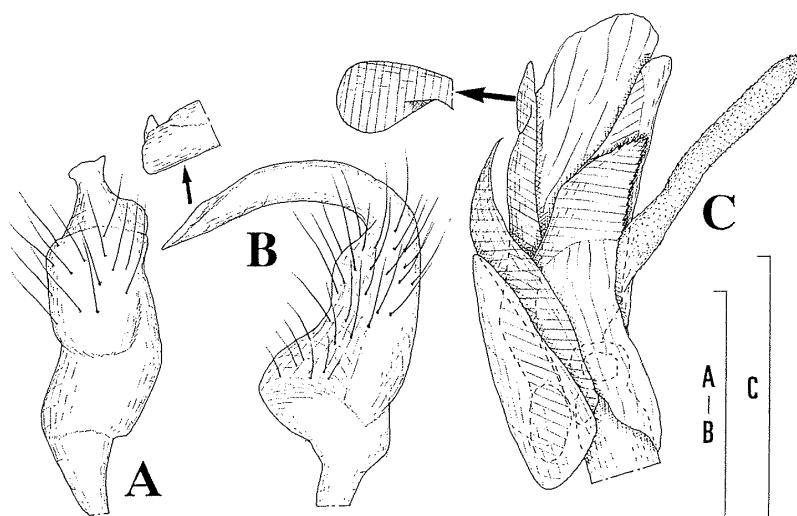


Fig. 1. Male genitalia of *Pinalitus nigriceps*. A, Right paramere; B, left paramere; C, vesica. Scales: 0.2 mm.

lobe sclerite that extends from rim of gonopore, pointed thin lateral lobe-sclerite and a spicule that is rounded and flattened at apex.

Dimensions. ♂: Body length 3.8–4.7, head width 0.9–1.0, pronotal width 1.3–1.5 and width across hemelytra 1.6–1.8; ♀: 3.9–4.4, 0.9–1.0, 1.4–1.6 and 1.7–1.9, respectively.

Specimens examined. JAPAN: [Honshu] 8 ♂ 3 ♀, Gunmatai, Hiraka-machi, Aomori Pref., 8. vii. 1989, T. ICHITA (IC); 1 ♂ 3 ♀, Iguri-sawa, Aomori C., Aomori Pref., 5. vii. 1992, T. ICHITA (IC); 1 ♂ 1 ♀, Kayano-chaya, Aomori C., Aomori Pref., 3. viii. 1986, T. ICHITA (IC); 1 ♂, Sukayu, Aomori C., Aomori Pref., 6. viii. 1992, T. ICHITA (IC); 1 ♂, Kamikôchi, Japan Alps, Nagano Pref., 6. viii. 1955, Y. UTSUGI (NIAES); 1 ♀, Mt. Kakezu, Geihoku-chô, Hiroshima Pref., 26. vi. 1986, T. YASUNAGA (AC); 8 ♀, Yawata Plateau, Geihoku-chô, Hiroshima Pref., on *Pinus densiflora*, T. YASUNAGA (AC). [Shikoku] 1 ♂ 1 ♀, Befu, Monobe vl., Kôchi Pref., 19. vii. 1992, I. YAMASHITA (AC); 2 ♀, Ohnogahara, Ehime Pref., 5. viii. 1993, T. YASUNAGA (AC). [Kyushu] 1 ♂, Mt. Shiratori, Izumi-mura, Kumamoto Pref., Kyushu, 6. vii. 1991 (light trap), T. YASUNAGA (AC); 1 ♂, Mt. Yamaingiri (1,100 m), Izumi vl., Kumamoto Pref., 26–27. vi. 1992 (light trap), M. MASUNAGA (AC). RUSSIA: 1 ♂, Ussurijsk Reserve, Primorskij Kraj, on *Pinus koraiensis*, 10. vii. 1993, T. YASUNAGA (AC).

Distribution. Japan (Honshu, Shikoku*, Kyushu*), Russian Far East (Primorskij Kraj).

This species is easily recognized by the small size, fuscous general coloration and yellow collar and basal margin of the pronotum. Closely allied to *P. rubeolus* (KULIK), a Far East Russian species, *P. nigriceps* is separable from it by the blackish head and pronotum; those of *P. rubeolus* are usually reddish.

In Japan *P. nigriceps* is associated with *Pinus densiflora*. It is occasionally attracted to light.

***Yamatolygus* gen. nov.**

Type species: *Yamatolygus pilosus* sp. nov.

Body oval; dorsal surface clothed with brownish hairs and silvery pubescence. Head vertical, with erect hairs; eyes almost contiguous to pronotal collar; vertex with basal transverse carina. Antennae rather short; 1st segment shorter than head width; 2nd segment less incrassate towards apex, about 3 times as long as 1st, shorter than pronotal width; 4th segment longer than 1st. Rostrum usually reaching hind coxae.

Pronotum distinctly punctate, with brownish suberect hairs and silvery decumbent pubescence; collar broad, covered with silvery pubescence; scutellum rather tumid. Hemelytra wide, densely covered with brownish suberect hairs and silvery decumbent pubescence. Legs relatively short; tibiae pubescent, with weak spines.

Left paramere strongly curved, with sensory lobe projecting basally, hypophysis rounded and hooked apically; right paramere almost straight. Vesica with a long spicule, median lobe-sclerite extending from rim of gonopore and apical sclerotized process. Sclerotized ring of female genitalia oval, rather enlarged (Fig. 5 F).

This new genus is characterized by the dorsal surface densely clothed with both silvery pubescence and brownish hairs, pronotum distinctly punctate, scutellum rather tumid, left paramere projected basally and vesica with a distinct spicule.

Yamatolygus species seem to live on broadleaved trees and are usually rare in Japan.

***Yamatolygus pilosus* sp. nov.**

(Figs. 2 B, 3 D–F, 5 F)

Brownish species. Body oval; dorsal surface almost brown, partially tinged with red, densely pubescent. Head brown, shining, vertical, with erect silky hairs; vertex 0.32–0.34 times as wide as head in ♂, 0.39–0.40 times in ♀, with distinct basal transverse carina, median part sometimes darkened; tylus entirely dark brown. First antennal segment varying from brown to dark brown, more than half as long as head width; 2nd segment dark brown, slightly longer than pronotal width, about 3 times as long as 1st, median part usually yellowish brown; the remainder dark brown; base of 3rd segment pale; length of segments I–IV as 0.69: 2.00: 1.10: 0.83 in ♂, 0.68: 1.90: 1.00: 0.75 in ♀. Rostrum pale brown, except for apex of 4th segment dark brown, reaching hind coxae; length of segments I–IV as 0.58: 0.63: 0.45: 0.78 in ♂, 0.58: 0.73: 0.45: 0.75 in ♀.

Pronotum shining brown, slightly tinged with red, deeply and rather densely

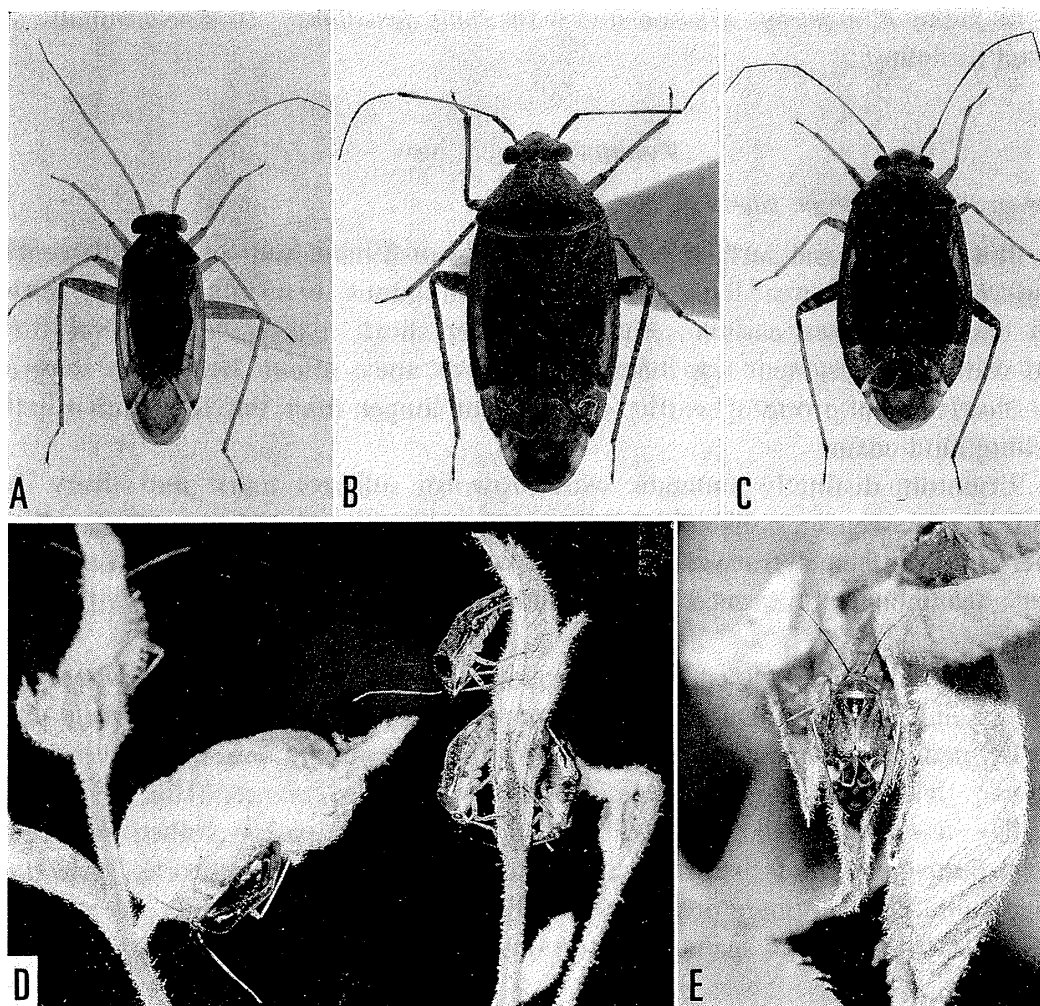


Fig. 2. A, *Pinalitus nigriceps*, male; B, *Yamatolygus pilosus*, female; C, *Pachylygus nigrescens*, female; D, adults of *Pachylygus japonicus* on *Rosa multiflora* at Momiki, Kumamoto Pref.; E, ditto, female.

punctate, with brownish suberect silky hairs and silvery decumbent pubescence anteromedianly, posterior part widely dark but margin usually yellowish brown; collar somewhat yellowish; mesoscutum and scutellum brown, with silvery short decumbent pubescence; the latter rather tumid, slightly paler at apex, bearing long erect silky hairs; ostiolar peritreme pale. Hemelytra brown, shallowly punctate, densely clothed with silvery decumbent pubescence and brownish suberect silky hairs; cuneus tinged with red, with dark apex; membrane grayish brown. Legs pale brown, rather short; femora with two apical obscure rings and sometimes with irregular dark markings; tibiae usually with black spots; tibial spines pale brown; apical part of each 3rd tarsal segment dark brown; length of hind femur: tibia: tarsus as 2.00: 2.60: 0.65 in ♂, 2.05: 2.75: 0.65 in ♂, proportion of hind tarsomere I–III as 5: 6: 8 in ♂, 3: 5: 5 in ♀.

Abdomen pale brown, lateral part sometimes darkened. Left paramere roundly projected basally; right paramere with extended hypophysis. Vesica with broad median sclerite and thin, broad lobe-sclerite.

Dimensions. ♂: Body length 5.7, head width 1.2, pronotal width 2.1 and width across hemelytra 2.4; ♀: 6.0, 1.3, 2.3 and 2.7, respectively.

Holotype: ♂, Mt. Osoreyama, Aomori Pref., Honshu, Japan, 2. viii. 1953, H. HASEGAWA (NIAES). Paratypes: [Honshu] 1 ♀, Iriyamabe, Nagano Pref., 2. viii. 1956, T. KIMURA (NIAES); 1 ♀, Mt. Ooe-yama, Ooe-cho, Kyoto Pref., 17. ix. 1984, M. TOMOKUNI (NSMT); 2 ♀, Ushiishigahara, Mt. Ohdaigahara, Nara Pref., 17. vii. 1988, S. MIYAKAWA (NSMT). [Shikoku] 1 ♂ 1 ♀, Mt. Takashiro, Nakagun, Tokushima Pref., 28. vii. 1979, M. YOSHIDA (NSMT); 1 ♂, Honkawa vl., Kôchi Pref., 12. vii. 1992, T. BEFU (AC). [Kyushu] 1 ♀, Daisen-rindô, Mts. Kujû, Oita Pref., on flower of *Hydrangea paniculata*, 1. viii. 1988, Y. ABE (AC); 1 ♂ 2 ♀, Mt. Shiratori, Izumi-mura, Kumamoto Pref., 27–28. vi. 1987, R. NODA (AC).

Distribution. Japan (Honshu, Shikoku, Kyushu).

This new species is allied to *Y. flavigenis*, from which it is distinguished by having the general coloration darker, and entire 1st and base of the 2nd antennal segments darkened.

Its confirmed host plant is *Symplocos chinensis* (Symplocaceae) (TOMOKUNI, pers. comm.).

Yamatolygus insulanus sp. nov.

(Fig. 3 G–I)

Body oblong-oval; dorsal surface generally brown, covered with both erect silky hairs and silvery caducous pubescence. Head brown, vertical; eyes large; vertex narrow, 0.28–0.30 times as wide as head in ♂, 0.33–0.38 times in ♀, with a basal transverse carina; jugum and lorum reddish; tylus dark reddish brown. Antennae brown, slender; 1st segment tinged with red; 3rd and 4th segments dark brown, except for base of the former pale; length of segments I–IV as 0.53: 2.05: 0.98: 0.75 in ♂, 0.53: 1.98: 0.98: 0.75 in ♀. Rostrum extending slightly beyond hind coxae.

Pronotum brown, somewhat tinged with red, shining, usually with a pair of dark spots anterior to calli, deeply and densely punctate, furnished with erect silky hairs and silvery caducous pubescence; basal margin narrowly yellow; collar yellowish, broad, about as thick as 1st antennal segment; scutellum brown, flat, sparsely and finely punctate, with erect silky hairs and silvery caducous pubescence; pleuron fuscous, shagreened; ostiolar peritreme yellow. Hemelytra brown, irregularly and finely punctate, densely covered with suberect silky hairs and silvery caducous pubescence; cuneus sometimes tinged with red. Coxae brown, shagreened; legs pale brown; apical half of hind femur dark, with two apical pale rings; femora and tibiae with long silky hairs; tibial spines brown; apical half of each 3rd tarsal segment dark; length of hind femur: tibia: tarsus as 1.73: 2.48: 0.55 in ♂, 1.80: 2.48:

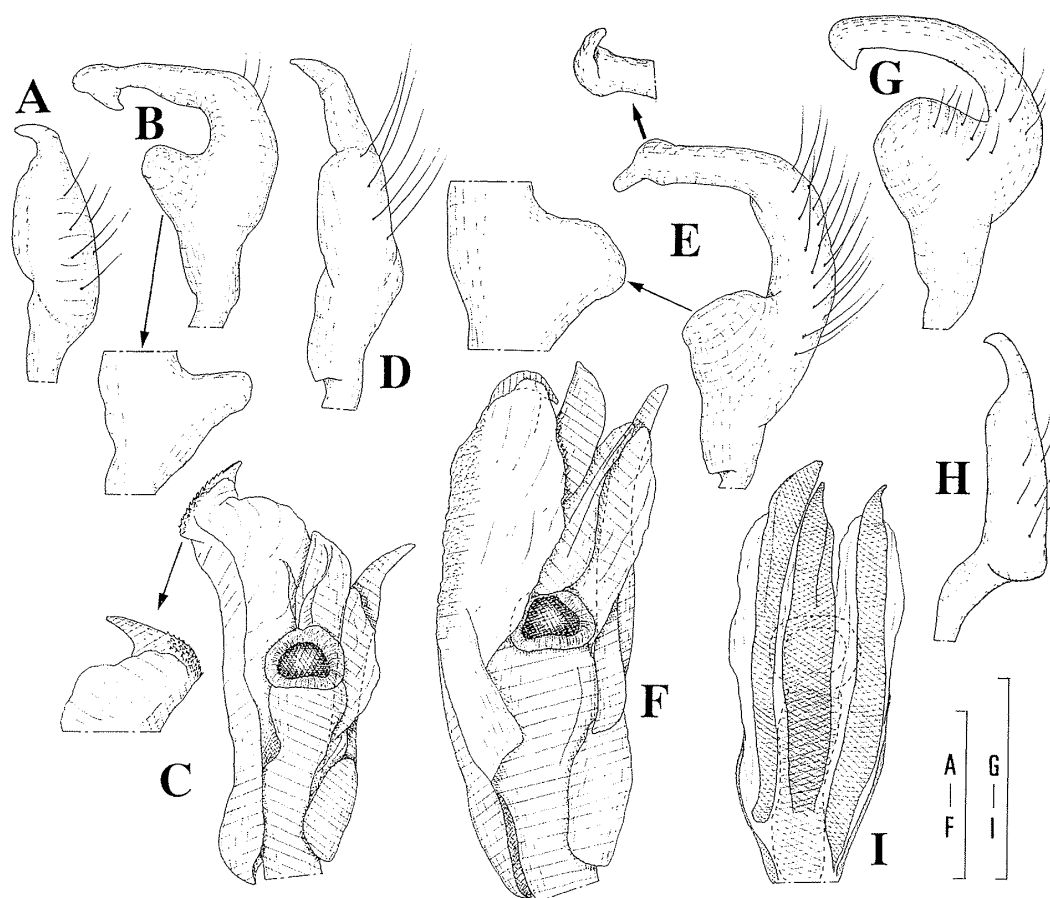


Fig. 3. Male genitalia of *Yamatolygus* spp. A–C, *Y. flavigenis*; D–F, *Y. pilosus*; G–I, *Y. insulanus* — A, D & H, Right paramere; B, E & G, left paramere; C, F & I, vesica. Scales: 0.2 mm.

0.50 in ♀; proportion of hind tarsomere I–III as 19: 24: 28 in ♂, 16: 25: 29 in ♀.

Abdomen brown, sometimes partially darkened. Left paramere strongly curved, with sensory lobe well developed and projected, hypophysis hooked at apex; right paramere almost straight, with slender hypophysis. Ventral surface of vesica with a long, straight spicule and two long lobe-sclerites.

Dimensions. ♂: Body length 4.8, head width 1.2, pronotal width 1.7 and width across hemelytra 2.2; ♀: 5.1, 1.2, 2.1 and 2.5, respectively.

Holotype: ♂, Materia Waterfall, Fukumoto, Yamato vl., Amami-Oshima Is., Kagoshima Pref., Kyushu, Japan, 12. v. 1987 (light trap), T. YASUNAGA (BLKU). Paratypes: [Tokara Is.] 2 ♂ 2 ♀, Takara Is., 16–17. v. 1991, T. UENO (AC). [Amami-Oshima Is.] 2 ♀, Chinaze, Naze C., 13. v. 1987 (light trap), T. YASUNAGA (AC). [Okinawa Is.] 1 ♀, Oura, 5. vi. 1990 (light trap), M. HAYASHI *et al.* (AC); 1 ♀, Chibana, 6. vi. 1990, M. HAYASHI *et al.* (AC); 1 ♂, Haneji, Nago C., 24. iv. 1993, S. AZUMA (AC); 1 ♀, Yona, Kunigami vl., on flower of *Schima wallichii*, 21. v. 1993, T. YASUNAGA (AC); 3 ♂ 2 ♀, same locality, 20–25. v. 1993 (light trap), T.

YASUNAGA (AC); 1 ♀, same locality, 24. v. 1993 (light trap), Y. NAKATAMI (AC).

Distribution. Japan (Ryukyus: Tokara Isls., Amami-Oshima Is., Okinawa Is.).

This new species is allied to *Y. flavigenis*, but the vertex is narrower, the scutellum is concolorously brown, the hypophysis of right paramere is longer, and the vesica lacks the apical hooked sclerite.

Yamatolygus insulanus is a southern species in distribution, occurring only in the Ryukyus. Its host plant is not determined, but I collected a female from the flower of an ever-green broad-leaved tree, *Schima wallichii* (Theaceae). It is occasionally attracted to light.

Yamatolygus flavigenis (HORVÁTH, 1905), comb. nov.

(Fig. 3 A–C)

Lygus flavigenis HORVÁTH, 1905, Ann. Mus. natn. Hung., 3: 419; LINNAVUORI, 1964, Annl. ent. fenn., 11: 269.

Pinalitus flavigenis: KERZHNER, 1988 a, Nov. maloiz. poluzh. Nasek. daln. vost. SSSR, Vladivost., p. 70; MIYAMOTO & YASUNAGA, 1989, in Check List Jpn. Ins., 1: 161.

Body oval; dorsal surface brown, densely covered with silvery pubescence. Head vertical, with erect silky hairs; vertex 0.33 times as wide as head in ♂, 0.41 times in ♀, with basal transverse carina; tylus dark brown. Antennae pale brown, except for apical 1/3 of 2nd, apical quarter of 3rd and almost entire 4th segments dark brown; 1st segment about half as long as head width; 2nd segment more than 3 times as long as 1st; length of segments I–IV as 0.50: 1.54: ? : ? in ♂, 0.50: 1.55: 0.81: 0.57 in ♀. Rostrum pale brown, extending between middle and hind coxae; apical part of 4th segment dark brown; length of segments I to IV as 0.50: 0.50: 0.47: 0.52 in ♀.

Pronotum brown, with two dark spots anterior to calli and symmetrical posterior obscure markings, deeply and densely punctate, covered with silvery decumbent pubescence, mesal length about as long as head width; posterior margin yellow; scutellum with yellow apex, punctate, slightly rugose, bearing silvery decumbent pubescence and brownish suberect hairs; ostiolar peritreme yellowish white. Hemelytra brown, densely clothed with silvery cadoucous pubescence and brownish suberect silky hairs; corium and clavus punctate; cuneus tinged with red. Legs pale brown; apical halves of femora dark brown, with two pale rings; bases of tibiae and 3rd tarsal segments dark; tibiae pubescent, with brown spines; length of hind femur: tibia: tarsus as 1.75: 2.30: 0.55 in ♀; proportion of hind tarsomere I–III as 5: 6: 8 in ♀.

Abdomen almost entirely pale brown. Sensory lobe of left paramere subtriangularly projected basally, hypophysis constricted subapically; hypophysis of right paramere small. Vesica with spinose apical process and short median lobe-sclerite.

Dimensions. ♂: Body length 5.1, head width 1.1, pronotal width 2.0 and

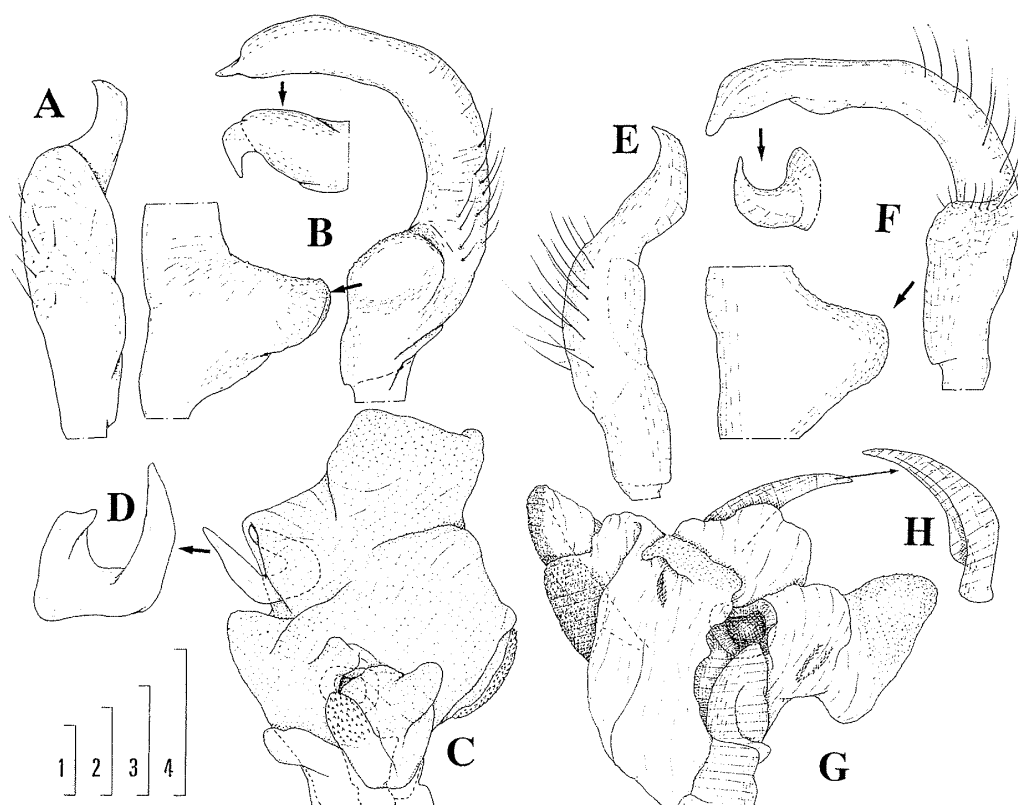


Fig. 4. Male genitalia of *Pachylygus* spp. A–D, *P. japonicus*; E–H, *P. nigrescens* — A & E, Right paramere; B & F, left paramere; C & G, vesica; D & H, apical spicule of vesica. Scales: 0.2 mm — 1 for C, 2 for G & H, 3 for D & 4 for A–B & E–F.

width across hemelytra 2.3; ♀: 5.1, 1.1, 2.1 and 2.5, respectively.

Specimens examined. [Honshu] 1 ♂ 1 ♀, Gifu Pref., 13. vii (HU). These specimens are regarded as syntypes, judging from the original description.

Distribution. Japan (Hokkaido, Honshu).

This is a rare species and very few specimens have been collected since its original description (HORVÁTH, 1905). Neither its ecology nor host plant is reported; it is probable that this species is associated with broad-leaved trees.

Pachylygus gen. nov.

Type species: *Orthops japonicus* KERZHNER, 1977.

Body oval; dorsal surface densely covered with silky hairs. Head somewhat oblique, with sparse erect hairs; eyes small, almost contiguous to pronotal collar; vertex wide, with weak and flat basal transverse carina; tylus somewhat projected anteriorly. Antennae slender, rather short; 1st segment shorter than head width; 2nd segment slightly incrassate towards apex, shorter than pronotal width; 3rd segment slightly longer than 4th. Rostrum reaching hind coxae.

Pronotum shining, uniformly covered with suberect silky hairs, lacking silvery hairs, anterolateral part with a seta behind each eye; collar about as broad as apex of 2nd antennal segment, bearing dark erect hairs only; scutellum strongly arched, with suberect silky hairs. Hemelytra shallowly and irregularly punctate, densely covered with silvery decumbent pubescence. Legs short; tibiae with brown spines; 3rd tarsal segment of hind leg slightly longer than 1st or 2nd.

Left paramere semicircularly curved, with sensory lobe developed basally, hypophysis widened subapically; right paramere almost straight, with hypophysis weakly hooked. Vesica with a spinose lobe-sclerite in front of gonopore and with a characteristic spicule distally. Sclerotized ring of female genitalia conspicuously enlarged and somewhat angulate (Fig. 5 G & H).

This new genus is related to *Yamatolygus*, but the eyes are even smaller, the vertex is wider, the 4th antennal segment is longer, the pronotum lacks silvery pubescence, the collar lacks silvery decumbent pubescence, the scutellum is tumid, the vesica possesses a characteristic spicule distally and a sclerotized plate in front of the gonopore, and the sclerotized ring of the female genitalia is thick and apparently enlarged.

Judging from the original description (KERZHNER, 1977: 14–15, figs. 30–35), a Far East Russian species, *Orthops festivus* KERZHNER, 1977, should be placed in this new genus (*Pachylygus festivus* (KERZHNER, 1977) comb. nov.).

***Pachylygus japonicus* (KERZHNER, 1977), comb. nov.**

(Figs. 2 D–E, 4 A–D, 5 G)

Orthops japonicus KERZHNER, 1977, Trudy zool. Inst. Akad. Nauk SSSR, **62**: 15, figs. 36–40.

Pinalitus japonicus: KERZHNER, 1988 a, Nov. maloiz. poluzh. Nasek. daln. vost. SSSR, Vladivost., p. 70; ICHITA, 1989, Celastrina, (22): 34; MIYAMOTO & YASUNAGA, 1989, in Check List Jpn. Ins., **1**: 161; YASUNAGA, 1991, Akitu, (n. s.), (123): 6.

Body variable in color; dorsal surface dark purple, but usually paler in female. Head pale brown, shining, pointed in front; vertex sometimes darkened, 0.44 times as wide as head in ♂, 0.48 times in ♀; frons and tylus widely dark. Antennae dark brown; 1st and median part of 2nd segments sometimes pale; length of segments I–IV as 0.65: 1.85: 1.05: 0.98 in ♂, 0.65: 2.03: 1.03: 0.98 in ♀. Rostrum shiny pale brown; apical half of 4th segment dark brown; length of segments I–IV as 0.50: 0.55: 0.45: 0.73 in ♂, 0.55: 0.60: 0.43: 0.65 in ♀.

Pronotum variable in color, usually shiny pale purplish brown, sometimes with variable symmetrical dark markings posteriorly, posterior margin narrowly pale, calli rather distinct; collar yellow; thoracic sides widely yellow; scutellum pale purplish brown, shining, with a pair of dark spots, or sometimes entirely darkened in male. Hemelytra almost unicolorous, varying from pale purplish brown to dark purple, shining; cuneus yellow, except for base and apex purplish brown, about twice as long as width; membrane pale grayish brown, partially translucent, with

yellowish veins. Legs yellow; femora usually with apical purplish brown markings; apices of tibiae and 3rd tarsal segments dark brown; length of hind femur: tibia: tarsus as 2.15: 3.10: 0.65 in ♂, 2.10: 3.10: 0.65 in ♀; proportion of hind tarsomere I–III as 6: 7: 12 in ♂, 6: 10: 13 in ♀.

Hypophysis of left paramere somewhat flattened and hooked at apex. Vesical spicule curved, with flat basal plate; sclerite in front of gonopore spinulate.

Dimensions. ♂: Body length 5.6, head width 1.1, pronotal width 2.2 and width across hemelytra 2.7; ♀: 5.7, 1.2, 2.3 and 3.0, respectively.

Specimens examined. [Honshu] 1 ♀, Inayama, Aomori C., Aomori Pref., 23. vii. 1989, T. ICHITA (IC); 1 ♂, Omachi C., Nagano, 26. vii. 1977, M. OWADA (NSMT); 8 ♂ 5 ♀, Mt. Kiso-Ontake, Nagano Pref., 11. vii. 1988, K. YAHIRO. [Kyushu] 42 ♂ 35 ♀, Izumi-mura (600–700 m), Kumanoto Pref., on *Rosa multiflora*, 24–26. v. 1990, T. YASUNAGA (AC).

Distribution. Japan (Honshu, Kyushu).

This species is recognized by the rather large size, oval body and purplish general coloration on the dorsal surface.

YASUNAGA (1991) reported that many adults and nymphs of this mirid were collected from its host plant, *Rosa multiflora* in late May. The nymphs feed on newly developed leaves and stems, and the new imagines appear in late May in Kyushu. It seems to be univoltine.

***Pachylygus nigrescens* (KERZHNER, 1977), comb. nov.**

(Figs. 2 C, 4 E–H, 5 H)

Orthops nigrescens KERZHNER, 1977, Trudy zool. Inst. Akad. Nauk SSSR, **62**: 12, figs. 23–29.

Pinalitus nigrescens: KERZHNER, 1988 a, Nov. maloiz. poluzh. Nasek. daln. vost. SSSR, Vladivost., p. 66; KERZHNER, 1988 b, Opredel. Nasek. daln. vost. SSSR, **2**: 813.

Body oval, relatively large; dorsal surface fuscous, covered with silky pubescence. Head dark brown, shining, rather vertical, with short erect silky hairs; vertex wide, 0.38 times as wide as head in ♂, 0.40 times in ♀, with basal transverse carina; lateral parts of vertex and frons sometimes pale. Antennae pale brown, except apical part of 2nd, entire 3rd and 4th segments dark brown; 1st antennal segment more than half as long as head width; 2nd segment slightly shorter than pronotal width; length of segments I–IV as 0.70: 2.25: 1.28: 0.98 in ♂, 0.73: 2.15: 1.28: 0.93 in ♀. Rostrum almost entirely shining dark brown, somewhat tinged with red, reaching hind coxae; length of segments I–IV as 0.75: 0.80: 0.45: 0.78 in ♂, 0.78: 0.75: 0.50: 0.80 in ♀.

Pronotum dark brown, shining, sometimes with irregular pale portions, deeply punctate, uniformly clothed with suberect silky hairs, anterior part sparsely covered with silvery decumbent pubescence, posterior margin narrowly yellowish; collar paler, 1.5 times as broad as 1st antennal segment, bearing silvery caducous pubescence; mesoscutum and scutellum with silvery pubescence; the former dark brown;

the latter blackish brown, shining, with pale apex, apparently arched, attaining as high as pronotum, sparsely covered with short erect hairs; ostiolar periterme yellowish brown. Hemelytra dark brown, wide, indistinctly and irregularly punctate, densely clothed with silvery short caducous pubescence and suberect silky hairs; cuneus tinged with red; membrane pale grayish brown, partially translucent. Legs rather short; femora dark brown, each with two apical pale rings; tibiae pale brown, except for bases and apices dark, with pale brown spines; tarsi pale brown; 3rd tarsal segments dark brown; length of hind femur: tibia: tarsus as 2.08: 3.05: 0.73 in ♂, 2.45: 3.40: 0.73 in ♀; proportion of hind tarsomere I–III as 3: 4: 4 in ♂, 3: 5: 5 in ♀.

Abdomen dark brown, ventromedian part sometimes widely yellowish. Left paramere strongly curved, with sensory lobe developed basally, hypophysis somewhat flattened apically; right paramere with somewhat widened hypophysis. Vesical spicule curved and pointed.

Dimensions. ♂: Body length 5.7, head width 1.3, pronotal width 2.2 and width across hemelytra 2.8; ♀: 6.3, 1.4, 2.4 and 3.1, respectively.

Specimens examined. [Hokkaido] 1 ♂, Nissho Pass, Shimizu-cho, 2. vii. 1987, T. YASUNAGA (AC). [Honshu] 2 ♂ 1 ♀, Gunmatai, Hiraka-machi, Aomori Pref., 24. vi. 1987, T. ICHITA (IC); 1 ♂, Sukayu, Aomori C., Aomori Pref., 20. viii. 1988, T. ICHITA (IC); 1 ♂, same locality, 29. viii. 1989, T. ICHITA (IC); 1 ♀, Tashirotai, Aomori C., Aomori Pref., 2. viii. 1982, T. ICHITA (IC); 1 ♂, same locality, 27. vii. 1989, T. ICHITA (IC).

Distribution. Japan (Hokkaido*, Honshu*), S. Kuril Is. (Kunashiri Is.).

This species is easily recognized by the blackish oval body, blackish tumid scutellum and dense silvery pubescence on the hemelytra. Related to the preceding species, *P. nigrescens* is easily distinguished by the fuscous coloration on the dorsal surface.

Pachyligus nigrescens is a northern species, known only from Hokkaido, northern Honshu and Kunashiri Is. It is known to be associated with *Kalopanax* spp. (KERZHNER, 1988 b).

Genus *Salignus* KELTON, 1955

Type species: *Lygus distinguendus* REUTER, 1875, Pet. nouv. Ent., 1 (136): 544, by monotypy. *Salignus* KELTON, 1955, Can. Ent., 87: 283; KERZHNER, 1988 b, Oprel. Nasek. dalm. vost. SSSR, 2: 813.

Body oblong-oval; dorsal surface fuscous, subshining, covered with both dark hairs and silvery pubescence. Head slightly oblique; vertex with weak basal transverse carina; frons with a mesal longitudinal groove and several rows of transverse sulci on each side. Antennae short; 2nd segment almost linear. Rostrum not reaching hind coxae.

Pronotum finely and densely punctate, uniformly covered with short silky

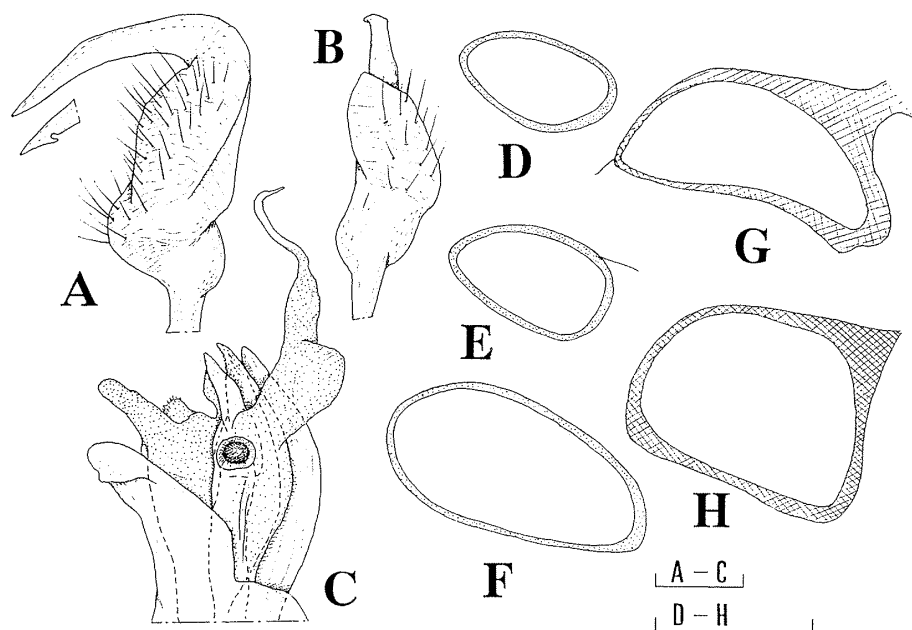


Fig. 5. Male and female genitalia of *Salignus duplicatus medius* (A–D), *Pinalitus nigriceps* (E), *Yamatolygus pilosus* (F), *Pachylygus japonicus* (G) & *P. nigrescens*. A, Left paramere; B, right paramere; C, vesica; D–H, female sclerotized ring. Scales: 0.1 mm.

pubescence, anterior median part bearing silvery caducous pubescence; collar about as broad as 2nd antennal segment; scutellum flat. Hemelytra shagreened, furnished with decumbent dark hairs and silvery caducous pubescence. Legs rather short; tibial spines sparse.

Left paramere strongly curved, sensory lobe well developed, hypophysis tapered and pointed at apex; right paramere with small, slender hypophysis. Vesica with several dorsal lobe-sclerites and with an extended, weakly sclerotized lobule. Sclerotized ring of female genitalia small and oval, similar in shape to that of *Pinalitus* (Fig. 5 D).

This genus is allied to *Pinalitus* KELTON, but is separable by the subshining dorsum, striolate frons, short antenna, fine punctures on pronotum, flat scutellum and different structure of vesica.

Salignus contains two Holarctic species associated with *Salix* spp.

Salignus duplicatus medius KERZHNER, 1979

(Fig. 5 A–D)

Lygus distinguendus var. *duplicatus* REUTER, 1906, Annu. Mus. zool. St. Pétersb., **10**: 47.

Salignus duplicatus medius KERZHNER, 1979, Trudy zool. Inst. Akad. Nauk SSSR, **81**: 33; KERZHNER, 1988 b, Opredel. Nasek. daln. vost. SSSR, **2**: 814; MIYAMOTO & YASUNAGA, 1989, in Check List Jpn. Ins., **1**: 161.

Lygus distinguendus: MIYAMOTO, 1972, Rostria, (22): 107.

Body oblong-oval; dorsal surface variable in color, usually fuscous, with irregular pale spots. Head blackish, shining; vertex and frons each with a pair of pale spots; the latter striolate. Antennae fuscous, short; 1st segment less than half as long as head width; 2nd segment shorter than pronotal width; length of segments I–IV as 0.43: 1.55: 0.63: 0.50 in ♂, 0.45: 1.63: 0.75: 0.48 in ♀. Rostrum shiny dark brown, reaching middle coxae.

Pronotum fuscous, shining, with irregular symmetrical pale markings, densely and finely punctate, uniformly covered with short silky pubescence, basal margin usually narrowly pale; collar varying from pale brown to fuscous; mesoscutum fuscous, sometimes with a pair of pale spots; scutellum blackish, with yellow apex, flat, lateral margin narrowly pale; posterior margin of ostiolar peritreme yellow. Hemelytra varying from brown to fuscous, with irregular pale spots, furnished with dark decumbent hairs and short silvery caducous pubescence; apex of cuneus dark; membrane dark grayish brown. Apices of coxae and trochanters yellow; femora dark chestnut brown, with irregular apical pale rings; tibiae brown, except bases and apices dark, with weak spines; tarsi fuscous; length of hind femur: tibia: tarsus as 1.55: 2.25: 0.65 in ♂, 1.88: 2.83: 0.75 in ♀; proportion of hind tarsomere I–III as 16: 29: 32 in ♂, 20: 33: 35 in ♀.

Abdomen dark chestnut brown, sometimes with two rows of pale spots laterally. Vesica with an extended lobule, its apex weakly sclerotized and hooked.

Dimensions. ♂: Body length 5.2, head width 1.0, pronotal width 1.8 and width across hemelytra 2.2; ♀: 5.7, 1.1, 2.0 and 2.4, respectively.

Specimens examined. [Hokkaido] 3 ♂ 2 ♀, Tokachi-mitsumata, Kamishihoro T., 5. vii. 1987, T. YASUNAGA (AC); 30 ♂ 30 ♀, Nissho Pass, 1. viii. 1986 (light trap), S. NOMURA (AC). [Honshu] 8 ♀, Ohtarum-toge, Yamanashi Pref., 31. vii. 1986, M. HAYASHI *et al.* (AC). [Kyushu] 2 ♂ 1 ♀, Mt. Shiratori, Izumi-mura, Kumamoto Pref., 29–30. vi. 1985, R. NODA (AC).

Distribution. Japan (Hokaido, Honshu, Kyushu), Russian Far East (Sakhalin), S. Kuril Isl.

This species is easily recognized by the somber brownish general coloration, striolate frons, fine punctures on the pronotum and short hairs on the hemelytra. The subspecies *medius* is distinguished from the nominotypical subspecies by its smaller body and different shape of the parameres; the latter is known from China (KERZHNER, 1988 b).

Its confirmed host plant is *Salix udensis* (KERZHNER, 1979, 1988 b). It seems to be univoltine and is frequently attracted to light. The cadaver becomes very oily after death.

Key to Japanese Species of *Pinalitus* and its Allies

1. Frons with a mesal longitudinal furrow and several rows of transverse sulci . . .
 *Salignus duplicatus*

- Frons almost smooth 2
- 2. Scutellum apparently arched, nearly as high as pronotum...3 (gen. *Pachylygus*)
- Scutellum flat, or not conspicuously arched 4
- 3. Dorsal surface blackish; punctures on pronotum deep and dense
.....*P. nigrescens*
- Dorsal surface paler, in male deep purple; punctures on pronotum fine and
shallow*P. japonicus*
- 4. Body small, slender, less than 5 mm in length; pronotum shiny black, with
yellow collar*Pinalitus nigriceps*
- Body oval, more than 5 mm in length; pronotum brownish, less shining.....
..... 5 (gen. *Yamatolygus*)
- 5. Vertex narrow, less than 0.30 times as wide as head (♂), less than 0.38 times
(♀); Ryukyus*Y. insulanus*
- Vertex wider, more than 0.32 times as wide as head (♂), more than 0.39 times
(♀); Mainland Japan 6
- 6. General coloration darker; base of 2nd and entire 3rd antennal segment dark-
ened*Y. pilosus*
- General coloration paler; bases of 2nd and 3rd segments pale*Y. flavigenis*

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Appendix

List of Specimens Examined of Exostic Species in This Study

1. *Pinalitus approximatus* (STÅL, 1858)
Specimens examined. USA: 2 ♂ 1 ♀, Pingree Pk. Colorado, 20. viii. 1925, H. H. KNIGHT (det. by H. H. KNIGHT, USNM).
2. *Pinalitus rubeolus* (KULIK, 1965)
Specimens examined. RUSSIA: 3 ♀, 17 km W of Krounovka, S. Primorskij Kraj, on *Pinus koraiensis*, 9. vii. 1993, T. YASUNAGA (AC).
3. *Pinalitus rubricatus* (FALLÉN, 1807)
Specimens examined. CZECHOSLOVAKIA: 1 ♂, Jeseniky, 22. vii. 1947, J. STENLIK (det. by T. J. HENRY, USNM). ROMANIA: 1 ♀, Carpathes, Sinaia Valachie, without date, A. L. MONTANDON (det. by P. R. UHLER as '*Lygus rubricatus* FALLÉN', USNM).
4. *Pinalitus rubrotinctus* KNIGHT, 1968
Specimen examined. USA: 1 ♂, Bnm. N. M., 19. vii, W. PIPPIN (det. by T. J. HENRY, USNM).
5. *Pinalitus solivagus* (VAN DUZEE, 1921)
Specimens examined. USA: 2 ♂ 1 ♀, Trinidad, Colorado, Stonewall 6,000', 8. viii. 1925, H. H. KNIGHT (paratypes of *P. brevirostris* KNIGHT, 1968, USNM).

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